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## NEW AND INSUFFICIENTLY KNOWN *EXOPROSOPA* FROM THE FAR WEST (DIPTERA: BOMBYLIIDAE)<sup>1</sup>

D. Elmer<sup>2</sup> and Lucile M. Johnson

In the course of identifying the bee-flies collected in the southern extension of the Great Salt Lake Desert, a number of apparently undescribed species have been discovered. Three of these species belong to the genus *Exoprosopa* Macquart. Two other species in this genus in our collection, one each from Arizona and California, are also apparently undescribed. Another species, *Exoprosopa doris* Osten Sacken, inhabiting at least part of the ranges of three of the species described herein, is not sufficiently well described in literature to be positively identifiable. A redescription of *E. doris* O. S. and descriptions of the new species are given below. The types of the new species are, for the time being, retained in our collection.

We wish to acknowledge the courtesy of Dr. Philip J. Darlington, Jr., Museum of Comparative Zoology, for comparing our specimens with the type of *Exoprosopa doris* Osten Sacken.

### *Exoprosopa doris* Osten Sacken

Figs. 3, 10, 18, 19, 25

Osten Sacken's description of this species overlooks several important definitive characters. In fact, his description fits so much better one of the species described below as new, that we were satisfied with our determinations only after Dr. Darlington had compared specimens of both species directly with Osten Sacken's type. Dr. Darlington informs us that the type is much smaller than the specimen sent him for comparison, being only five millimeters in length. Since our series contains specimens from seven to sixteen millimeters long, size is not considered to be an important factor.

A redescription of this species follows:

*Male*.—Oral margin, face and lower half of front red, rest of head black. Vertex brown pollinose, occiput gray pollinose. Pile of front short, sparse, suberect, black, that of face appressed, black in the middle, nearly white on cheeks. Tomentum of front and middle of face subshining tan, of cheeks nearly white, that of occiput shining white. First antennal segment red, three times as long as broad; second segment red below, dark above, not quite as long as broad;

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2. Associate Entomologist, Ecological Research, University of Utah, Dugway, Utah.

third segment black, long-conical. its style about one-half as long as the basal portion. Pile of antennae black. two or three golden hairs on the outside of the first segment.

Thorax mostly black, brown pollinose on the dorsum, thinly cinereous on the pleura. Pile of collar pale yellowish; of mesonotum short, sparse, black; of pleura pale yellowish above, white below. Tomentum of mesonotum brown, paler on the anterior portion and on three very indistinct vittae; white above each wing and adjacent to the scutellum. Tomentum of pleura white, that on sterno- and hypopleura appressed and shining. Scutellum red, narrowly black basally, pile black, marginal bristles black, submarginals yellow; tomentum golden brown, paler apically, narrowly white basally.

Wings hyaline. base, costal margin and first basal cell brown; clouds of brown in the marginal, first marginal, and first posterior cells form an indistinct, interrupted fascia; a proximal fascia is formed by brown in the discal cell through the anal cell, invading the distal end of the second basal and proximal ends of the third and fourth posterior cells. There are clouds at the base of the discal, on the anterior cross-vein, on the base of the second vein, and near the base of the vein separating the second and third posterior cells. Tomentum at base of costa brown, narrowly white posteriorly along the vein, pile black.

Coxae brown, trochanters black, femora and tibiae red, tarsi red basally, darkening distally until the last three segments are black. Pile of coxae pale yellow and white, of femora black on anterior half and nearly white posteriorly. Tomentum of coxae shining white, of rest of legs pale yellowish, black on forward side of tibiae and on forward distal part of femora. Bristles of legs black. Stems of halteres pale brown, their knobs nearly white.

First abdominal segment and medial third of second to fifth tergites black, a black triangle basally on sixth. Rest of abdomen red. Pile of first and on sides of anterior three-fourths of second segments abundant, pale yellow, on sides of rest of segments mixed black and pale yellow, the black concentrated on the hind angles of the segments. A little very sparse, short black pile on dorsum, mostly near hind margins of segments. A row of coarse, mostly black pile across hind margins of sixth and seventh segments. There is a fringe of ocheraceous scales along hind margin of first segment. Tomentum of anterior half of second white, posterior half ocheraceous, a broad fascia of black scales, interrupted in the middle, between the ocheraceous and white scales, a black fringe on hind margin. A fascia of mostly black scales across the anterior half of third tergite which does not reach the lateral margins, behind this is ocheraceous tomentum; a fringe of black scales across hind margin is quite broad medially; a few white scales are on the sides of the segment. Tomentum of fourth tergite mostly white, narrowly black basally and apically, a median patch of mixed black and ocheraceous; rest of tomentum ocheraceous. Tomentum of sixth and seventh tergites shining white.

Venter red, pile nearly white, tomentum of first four sternites shining white, of rest of venter pale yellowish, a few black scales on fourth and fifth sternites. Genitalia red, pile pale yellow.

*Female*.—Much like the male. A few more black scales on the legs. The tomentum of sixth tergite is pale tan with a fringe of slightly darker scales on the hind margin.

These descriptions were prepared from specimens collected in Tooele County, Utah. We have examined specimens from Arizona, California, Idaho, Nevada, Texas and Utah. The specimens we have personally collected have been found mostly in desert conditions, usually on the valley floors rather than in the mountains.

In addition to the considerable difference in size there are some differences in color of vestiture. The specimens from California have fewer black hairs on the face, and some specimens lack them almost altogether, have fewer or no black hairs on the hind margins of the sixth and seventh terga, and have less black tomentum on the abdominal dorsum than specimens from Utah and Idaho. Within the series studied the amount of brown in the wing varies from two practically unbroken fasciae to hardly more than faint, interrupted shadows at these points. There is considerable variation in the number of black scales on the abdominal venter. Some specimens have black scales on all sternites, while some have only a very few on the fifth. There is more or less variation in the relative length of the antennal style. In some specimens the second antennal segment is wholly black, while in others it is wholly red. One specimen from Utah has the first posterior cell closed in one wing and open in the other, while one California specimen has this cell closed in both wings and very short petiolate. Despite these differences we consider these specimens to be all the same species.

*Exoprosopa hyalipennis* Cole is like this species, the principal difference being in the color of the wings. Our series of *doris*, in which is to be found every intergrade between a very heavily infuscated wing and an almost completely hyaline one would indicate that this character alone might be unreliable as a means of identification of some single specimens.

*Exoprosopa arenicola*, n. sp.

Figs. 5, 11, 23, 24, 27

Related to *doris*, but has fascia of white scales on anterior mesonotum and lacks fasciae of black scales in centers of second and third tergites. Length  $5\frac{1}{2}$ -14 mm.

*Male*.—Face, cheeks and most of front red, extreme upper front and occiput black, vertex thinly brown pollinose, occiput thinly cinerous. Tomentum of face and front sub-shining brownish yellow, somewhat darker on upper front, and paler on central part of face. Tomentum of occiput white, yellowish at vertex. Pile of head yellow, two or three dark hairs on each orbit near vertex and a few short black hairs on ocellar tubercle. First antennal segment red, about

twice as long as wide, a few black hairs on upper side distally, rest of pile golden. Second segment brown, only about half as long as wide, nearly as wide as first segment, short black pile on upper side, golden beneath. Third segment black, long conical, about three times as long as wide, its style little if any longer than the width of the segment at its widest. Proboscis short, only the tips of the labellae projecting beyond the epistoma.

Thorax mostly dark brown, pile pale yellowish, nearly white below the wings. A fascia of white tomentum across anterior third of mesonotum extends backward at each side above the wings to scutellum, a second very narrow fascia lies immediately before the scutellum; rest of mesonotal tomentum golden brown; tuft of long snowy hair-like tomentum on mesopleura below wing; a small patch on hypopleura and most of sternopleura covered by appressed snow-white tomentum. Notopleural bristles black, postalars red. Scutellum red, narrowly black basally, its tomentum white basally and very narrowly apically, otherwise golden brown.

Scutellar bristles mixed black and reddish yellow, mostly the latter. Coxae brown, golden pilose and tomentose, rest of legs evidently red in ground color, densely tomentose. Tomentum of tibiae mostly black, golden brown externo-proximally. All vestiture of tarsi black, the last three segments evidently black in ground color. Sparse short pile of femora and all bristles of legs black.

Wings hyaline, bi-fasciate with brown. The distal fascia extends from near end of auxiliary vein across the marginal, first sub-marginal, and first posterior cells, and across distal end of discal and proximal end of second posterior cells, and narrowly invades third posterior cell. Proximal fascia begins at bifurcation of second and third veins and crosses wing into axillary cell, invading bases of discal and first, third and fourth posterior cells, and distal ends of both basal cells, crosses anal cell in its distal third, but does not reach hind margin of wing. Base of wing and costal margin also yellowish brown. Veins brown. Tomentum at base of costa yellow, white at extreme base and narrowly along vein posteriorly, pile black. Halteres pale brownish, knobs pale yellow.

Abdomen mostly red, first segment and triangles on second and third black. Pile on lateral margins mostly yellow, paler on first and second segments, a few black hairs on hind angles of third and fourth, and many black hairs on lateral margins of fifth segments. First segment with fringe of tan scales along hind margin. Hind margins of second to fifth tergites narrowly black tomentose, the black scales not reaching the lateral margins on any segment, confined to a narrow spot in the middle of the fourth. Anterior half of second, most of fourth and all of seventh segment white tomentose. Fourth tergite, caudal half of second, most of third and fifth, and very narrowly basally and apically on sixth tannish tomentose. The tan tomentum on third tergite is paler basally, being nearly white on the sides on the anterior half. The very short sparse pile of the abdominal

dorsum is black on second to fifth tergites. Venter red, pile nearly white. Tomentum of first four sternites moderately dense, snow-white; of fifth to seventh pale yellow, a few dark scales at the base of fifth. Genitalia yellowish red, hairs yellow.

*Female*.—Very much like the male. Tomentum of face much paler, being nearly white on lower front and center of face. The wings are somewhat less infuscated, particularly in the area of the distal fascia. Somewhat more black pile on the first antennal segment. Second antennal segment, as well as first, red. There is much more black in the ground color of the abdominal dorsum, this color being present on all segments, fourth, fifth and sixth tergites being largely dark. Tomentum at the base of third and most of that on fourth tergites white, or nearly so. Fifth and sixth sternites black medially. Genitalia brown, hairs and bristles yellowish brown.

*Types*.—Male *holotype* and female *allotype*: West side Little Granite Mountain, Tooele County, Utah, July 27, 1955 (D. E. Johnson). *Paratypes*: 54♂ 60♀ Little Granite Mountain, VII-19 - IX-15; 3♂ 2♀ southwest end Cedar Mts., VII-20 - VIII-4; 4♂ 12♀ southeast end Cedar Mts., VII-20 - VIII-21; 4♂ 18 miles southwest Orr's ranch, VII-9 - VIII-11. All localities in Tooele County, Utah, all specimens collected by D. E. Johnson. Part of the paratypes are in the collection of the University of Utah.

This species varies quite remarkably in size. The smallest specimen in our collection is a male 5.5 millimeters in length, the largest a female that is 14 millimeters. The smallest female is 6 millimeters, the largest male 12 millimeters. The females average appreciably larger than the males, the thirty-one females measured averaging 10.1 millimeters in length, while the nineteen males averaged only 8.3. There is considerable variation in the extent of infuscation in the wings. The darkest specimen is a male in which both wing fasciae are uninterrupted. The specimen having the palest wings is a female in which the distal fascia is reduced to a faint shadow in the middle of the posterior cell and the proximal fascia is reduced to spots on the anterior and posterior cross-veins and at the bases of the discal and third posterior cells, and faint clouds in the distal third of the anal and proximal third of the discal cells. In many specimens of both sexes the second antennal segment is black, in some it is red. In most males it is brown and in most females it is red as in the types. In one small male and one small female the tomentum of the seventh tergite is yellow.

All specimens seen were encountered in sandy areas, hence the name. Most of the ones collected were taken in vegetated dunes, where the dominant vegetative types are *Eriogonum* and *Chrysothamnus*. Most of the specimens were captured on the ground. A few were observed to be feeding at blossoms of *Eriogonum dubium* Stark, the only plant blooming in the area at the time. The species was not common until about the middle of August, after which time it was

fairly abundant. By the time the last specimens were collected, in the middle of September, the species was again becoming scarce, as were all bee-flies in the area.

*Exporosopa butleri*, n. sp.

Figs. 1, 12, 13, 14, 28

Related to *E. iota* O.S., but with a fascia of white scales across anterior mesonotum and with red face and legs. Tomentum of sixth abdominal segment tan. First posterior cell closed and long-petiolate. Length 9-17 mm.

*Male*.—Face and lower third of front red, cheeks yellow, rest of head black. Pile of front black, that of face pale yellow, tuft of black pile on anterior angle of epistoma. Tomentum of face and front subshining pale tan, nearly white on cheeks, sparse on upper two-thirds of front. Tomentum of occiput shining white, becoming yellowish toward vertex. First antennal segment about twice as long as wide, a little more than twice as long as the second segment; third segment long-conical at base, without its style about as long as first two combined. Style not quite as long as first segment, very slightly longer than the width of the third segment. First two segments red, with black pile; third segments black. Tips of labellae barely project beyond the epistoma. Palpi one-fourth the length of the proboscis, brown with pale hairs.

Thorax mostly black, pleura with some red. Mesonotum thinly brown pollinose, pleura thinly cinereous pollinose. Pile of collar pale yellow, that of rest of mesonotum very short, black. A fascia of white tomentum across anterior third of mesonotum, extending backward above the wings to posterior angles of thorax. A narrow band of white scales just before the scutellum, rest of tomentum of mesonotum pale golden brown, somewhat lighter at sides. A tuft of white hair-like tomentum below wing on posterior angle of mesopleura, immediately before and behind which are tufts of pale yellow hair. Patches of appressed, snow white, shining tomentum on sterno- and hypopleura. Scutellum red, narrowly black basally, tomentum subshining pale tan, sparse pile black, large marginal bristles black; a row of finer, shorter bristles below (posterior to) these are yellowish.

Legs red, coxae brown. Tomentum of fore coxae pale yellow, of middle and hind coxae white; pile of middle and fore coxae mixed with black, red and yellow, of hind ones nearly white. Tomentum of legs mostly yellow, that on fore part of tips of femora and front of tibiae black. Pile sparse, short and fine, that on forward half of femora black, on posterior half pale, bristles black.

Wings gray hyaline, brown at base and anterior to fourth vein, with two darker transverse fasciae. The distal fascia begins at about the end of the auxiliary vein and extends obliquely through the first posterior, very narrowly invading the tip of the discal and anterior angle of the second posterior cells. The proximal fascia begins in the marginal cell opposite the anterior cross-vein and extends in an ir-

regular, diagonal, inverted arc to the distal third of the axillary cell, invading the bases of first submarginal and first, third and fourth posterior cells, the distal ends of both basal cells, and crossing the proximal third of the discal and distal third of the anal cells, but not reaching the margin of the wing. There is a spot of brown on the base of the vein separating the second and third posterior cells. About the distal fifth of the marginal, first submarginal and first posterior cells are hyaline. The first posterior cell is closed and long-petiolate. The fourth vein joining the third at a point about three-fifths the distance between the branching of the latter vein and the wing margin. Tomentum at base of costa tan with a few white scales along the base of the vein posteriorly, pile black. Stems of halteres brown, knobs nearly white.

Abdomen red, first segment and broad triangle on central base of second segment, and smaller similar triangle on third black. Nearly white pile on sides of segments, abundant on first and anterior half of second segments, sparse on fore angles of following segments. Black pile on hind angles of second and following segments except seventh. Very sparse short black pile near hind margins of second to sixth tergites. Tomentum of hind margin of first segment mixed with tan and black, basal half of second white, caudal half rufus, with fringe of black scales on hind margin and an interrupted fascia of black between white and rufus scales; third segment rufus, nearly white laterally and with a broad, interrupted fascia of black, a very narrow fringe of black scales on hind margin; fourth segment nearly all white, narrowly mixed with tan and black basally and on hind margin; fifth and sixth segments tan, the fifth with narrow interrupted fascia basally and narrow fringe on hind margin of black scales; tomentum of seventh segment white, faintly yellowish centrally. Abdominal venter yellow, pile and tomentum nearly pure white; genitalia yellow.

*Female*.—In general appearance much like the male. Pile of face black except at the sides. Abdomen broadly black on all segments. Pile of seventh tergite and genitalia mostly black. Many more black scales on abdomen. Tomentum at base of wings brownish.

*Types*.—Male *holotype*, four mi. E. Apache Junction, Arizona, May 15, 1954 (George D. Butler, Jr.). Female *allotype*, Sycamore Canyon, Atascosa Mts., Arizona, May 22, 1955 (George D. Butler, Jr.). on *Senecio longilobus*. *Paratypes*: 1 ♀ Atascosa Mts., V-22-54 (Butler); 1 ♂ Sycamore Canyon, Atascosa Mts., V-24-1954 (Butler); 1 ♀ Catalina Mts., 2 mi. HkHy, V-8-1954 (Butler); 1 ♀ Catalina Mts., 5 mi. HkHy, VIII-22-1954 (Butler); 1 ♀ Claypool, VIII-27-1956 (Butler and Gerhardt); 1 ♂ Elfrida, VII-27-1954 (Butler); 1 ♂ Mesa, IV-10-1952 (D. E. Johnson); 1 ♀ 6 mi. S. Mountain View, V-5-1954 (Butler); 1 ♂ 1 ♀ Sacaton, VI-4-1956 (A. D. Telford); 1 ♂ Sahuarita, IV-19-1956 (Butler); 1 ♂ Seneca, Salt River Bridge, VII-15-1956 (Butler); 1 ♀ Sunnyslope, V-26-1954 (Butler); 1 ♂ 2 mi. E. Texas Canyon, Cochise County, V-11-1956 (A. D. Telford); 1 ♂ Tombstone.

V-2-1956 (Butler and Werner); 1 ♂ Thompson Arboretum, Superior, VII-23-1956 (Butler and Gerhardt); 1 ♀ same locality, V-15-1954 (Butler); 1 ♂ 3 ♀ Tucson, III-15 - V-7-1956 (Hastain, Shelly, Stewart); 1 ♀ 10 mi. N. Tucson, IV-24-1955 (Butler). All of the above localities are in Arizona. Part of the paratypes are in the collection of the University of Arizona.

In addition to the differences in size there is more or less variation in the extent of the brown in the wing in this species. In some specimens the proximal fascia is interrupted in the discal cell. In others the distal fascia joins the brown spot at the base of the third posterior cell. In some specimens the juncture of the fourth and third veins is nearer the branch of the latter than in the holotype. The holotype has an adventitious cross-vein that is not present in any of the other specimens at hand. In most specimens the small cross-vein is exactly opposite the base of the second vein. There is some variation in the amount of black tomentum on the abdomen.

This species appears to be most closely related to *iota* O.S. It differs from the description of that species in having the face, most of the abdomen and the legs red rather than black as in *iota*, and in having silvery scales on the seventh tergite only. In his description of *iota* Osten Sacken makes no mention of white scales anteriorly on the mesonotum, such as are present in *butleri*. *Butleri* may be separated from *doris* by the wing venation, by the presence of silvery white tomentum on the seventh tergite only, of the males, by the lack of black tomentum on the abdominal venter, and by the fascia of white scales across the anterior mesonotum. It may be separated from *arenicola* by the wing venation, by the larger average size, and by the fasciae of black scales on the abdominal dorsum.

The single specimen collected by the senior writer was captured in a dry, sandy stream bed, along with a number of other species of bee-flies.

It gives us pleasure to name this species in honor of Dr. George D. Butler, Jr., Department of Entomology, University of Arizona, who has collected many fine bee-flies in southern Arizona.

*Exoprosopa cingulata*, n. sp.

Figs. 7, 8, 17, 22

Wings bifasciate with brown, abdomen white tomentose with a cross-band of tan scales, legs entirely red. Length 12-14 mm.

*Male*.—Lower third of occiput, face, and all but extreme upper front red, upper front and upper two-thirds of occiput dark brown, thinly brown pollinose. Tomentum of face, front and vertex brownish yellow, nearly white on sides of face, subshining on face and lower two-thirds of front. Tomentum of occiput nearly white, appressed and shining on post-orbits. Pile of upper third of front black, of rest of head yellow. Barely the tips of the labellae projecting beyond the epistoma. Proboscis dark brown, palpi red, pile brownish yellow. First two antennal segments red, third brown, paler apically; first segment



nearly twice as long as wide, second about three-fourths as long as wide, not quite as wide as first segment. Third segment long conical, without its style about as long as the first two combined, style very slightly longer than width of the third segment at its widest part. Antennal pile nearly all yellow, a few black hairs on upper side.

Thorax brown, pleura with considerable red. Mesonotum thinly brownish pollinose. Pile of thorax mostly pale yellow, a very few short black hairs on the mesonotum near the suture. Tomentum of mesonotum golden brown, white above the wings and on the pleura, the small patch on the sterno- and a large patch on mesopleura appressed, shining. Notopleural bristles black, rest of bristles of thorax reddish yellow. Scutellum red, narrowly black basally, its tomentum golden brown except basally where it is white, bristles reddish yellow.

Wings hyaline, bifasciate with brown. Distal fascia begins near end of auxiliary vein and extends backward more or less brokenly to base of second posterior cell. Proximal fascia begins at the bifurcation of second and third veins and ends half way across the axillary cell. Base of the wing, costal and subcostal, most of the first basal, and proximal half of first posterior cells also brown. Veins brown, somewhat darker distally. Tomentum at base of costa mostly white, pile black. First posterior cell closed in wing margin. Halteres brownish, knobs nearly white.

Legs red, only the last two or three segments of the tarsi black. Pile and tomentum of coxae nearly white, of rest of legs reddish yellow, a few dark brown scales externo-distally on the femora. Bristles black.

Abdomen red, base of first and triangles on second and third segments black. Except for a few short black hairs on hind margins of second to fifth tergites, pile of abdomen pale yellow. Tomentum nearly all white, that on sixth and seventh tergites shining. Fringe of black scales on hind margins of second and third tergites, a very few on fourth. Caudal third of second, most of third, and a very narrow row basally on fourth with tan tomentum. Venter red, pile nearly white, tomentum of first four segments white, of rest of venter pale yellow. Genitalia yellowish red, hair pale yellow.

*Female*.—Much like the male. Brown of front somewhat more extensive than in male. Pleura red. Triangle of black ground color in the fourth tergite, as well as in second and third. White of abdomen tinged with yellowish, that of last two segments distinctly so. Only a few darker scales near the tips of middle and hind femora. The first posterior cell is narrowly open at the wing margin.

*Types*.—Male *holotype* and female *allotype*, Weldon, Kern County, California, August 5, 1945 (D. E. Johnson). *Paratypes*: 1 ♂ same data; 1 ♂ Onyx, Cal., August 23, 1940 (L. J. Lipovsky); 1 ♂ Rosemond, California, July 23, 1940 (R. H. Beamer).

In the left wing of one paratype male the first posterior cell is not quite closed, but in the others is like the type.

This species may be most easily separated from *doris* by the lack of black scales on the abdominal venter, by the lack of fasciae of black scales on the centers of second and third tergites, and by the presence of nearly all white tomentum on fourth and fifth. This species lacks the fascia of white scales on the anterior mesonotum that is possessed by *arenicola* and *butleri*, as well as having the differently colored abdominal dorsum. The effect of the general appearance of this species is that of having a white abdomen across which is a dark-bordered tan band, from which the name derives.

This species was taken, along with a number of other species of bee-flies, on a sandy knoll at the roadside just beyond the small village of Weldon, on California State Highway Route 178. These specimens were captured just before sundown of a hot dry day. They were alternately flitting about and resting on the ground, usually returning to the same spot to rest after being disturbed.

*Exoprosopa sharonae*, n. sp.

Figs. 2, 6, 15, 16, 26

Related to *titubans* O. S., but the antennal style is shorter and the abdominal tomentum is mostly dark. Length 16-21 mm.

*Male*.—Cheeks and oral margins yellow; face and most of front black, a red patch across the front one-third the distance between the ocellar tubercle and the antennae, extending down the orbits, and joining the yellow of the cheeks. Rest of head black. Pile of front and vertex black, that of face black in dark areas and yellow where the ground color is light; there is a tuft of short black hair on the anterior oral margin. Tomentum of front and face subshining, brownish yellow. Postocular tomentum shining yellowish silver; occipital pile short, very pale yellow in color. Upper occiput purplish, upper front brownish pollinose. First and second antennal segments red beneath and black above, pile mostly black, a few pale hairs beneath on the first segment. First segment twice as long as second; third elongate-conical and with style twice as long as the first two combined; style short, scarcely longer than width of third segment. Proboscis short, the labellae scarcely projecting beyond the epistoma. Palpi dark brown, pile black.

Thorax black, faintly brownish gray pollinose, postalar callosities and parts of pleura reddish. Tomentum of mesonotal disc mostly black, three more or less indistinct vittae of pale grayish yellow tomentum on anterior half, broadening and fusing behind to form a patch nearly as wide as the scutellum. Pile of disc short, sparse and black, with a few pale hairs immediately before the scutellum. Pile of collar, pleura, and above wings pale buff, bristles black. Scutellum red, narrowly black at base, most of tomentum black, with buff on margins and behind; bristles and pile black except a few pale hairs on sides.

Legs black; pile of coxae mixed black and yellow, tomentum pale

yellow. Rest of vestiture of legs black except for a few light colored scales on under side of femora.

Wings cinereous hyaline, brown basally and from immediately behind the fourth vein forward, which color is somewhat evanescent distally, extending from the distal fifth of the discal cell to the end of first vein. Darker clouds surround the small cross-vein and base of second vein, base of vein separating discal and second basal cells, and bases of third and fourth posterior cells; a faint cloud is present at base of second posterior. The fifth vein is narrowly bordered with brown to near its tip. This leaves the discal and second basal cells narrowly bordered with brown. Veins brown, darker distally. setulae black. Squamae pale brown with brownish yellow fringe. Stalk of halteres brown, dark yellowish knob.

Center of abdominal segments two to five black, their sides broadly red. Segments six and seven entirely red. Tomentum mostly black, basal half of second, anterior corners of third, most of fourth and sixth, and all of seventh white. Fourth segment narrowly black tomentose in center and with a black apical fringe. There are a few pale scales on sides of fifth segment and a narrow band of yellow scales basally across third. Pile short, sparse, and pale yellow from fourth segment forward on dorsum; long, dense, and nearly white on sides of first and second, shorter on sides of remaining segments, white on anterior corners of third and fourth, black on hind corners of second, third and fourth, and on sides and hind margins of fifth and sixth; pile of seventh segment pale yellow. Venter red; pile and tomentum nearly white except for a few black scales on fifth segment.

*Female*.—Like the male except fewer black scales on the dorsum of the mesonotum; very narrow transverse band, interrupted in the middle, of pale scales traverse center of third segment; hind margin of seventh segment and genitalia with black pile.

*Types*.—Male *holotype*, west side of Little Granite Mountain, Tooele County, Utah, September 3, 1955 (D. E. Johnson). Female *allotype*, southeast end of Cedar Mountains, Tooele County, Utah, September 3, 1955 (Sharon Johnson). *Paratypes*: Millard County: 1♂ 1♀ Delta, VIII-19-1957 (D. E. and L. M. Johnson); 1♂ 1♀ Topaz (17 mi. N.W. of Delta), VIII-27-1943 (D. E. Johnson). Tooele County: 27♂ 11♀ same locality as holotype, VIII-12 - IX-14 (D. E. Johnson); 2♂ same locality as allotype, IX-4-15 (D. E. Johnson); 1♂ Simpson Springs, VIII-17-1953 (R. B. Holliman). Part of the paratypes are in the collection of the University of Utah.

This species varies to some extent in size, in the amount of red on the front, and in the amount of light colored pile on the third abdominal segment. In this respect some of the males exhibit the same narrow interrupted band of light colored tomentum as on the allotype female, others have only a few scattered yellow scales. On a few of the male specimens the light colored scales of the second segment are tinged with yellow immediately adjacent to the black



Fig. 1

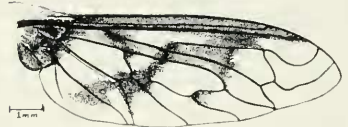


Fig. 7



Fig. 2

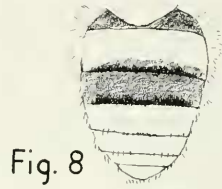


Fig. 8

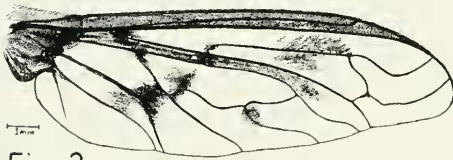


Fig. 3



Fig. 9



Fig. 4



Fig. 10



Fig. 5



Fig. 6



Fig. 11



Fig. 12

scales. The length of the antennal style varies from about the same as the width of the third segment to about one and one-half times that length.

This species is closely related to *E. sordida* Loew, but has a shorter antennal style, shorter proboscis, and darker wings. The face of *sordida* is mostly red, with only a small area of black in the middle. The face of *sharonae* is almost wholly black. The pale scales of *sordida* are pale brown or grayish yellow, while those of *sharonae* are white or nearly so. *Sordida* has a generally brownish appearance; *sharonae* appears to be distinctly black and white.

The holotype and most of the paratype specimens were collected on the west side of Little Granite Mountain, Tooele County, Utah. The lower slopes of this so-called "mountain" are occupied in part by a horizontal band of Utah Juniper, *Juniperus osteosperma*. In the upper edge and immediately above the junipers is a narrow area of partially vegetated sand dunes. Above the dunes the vegetation is composed chiefly of shadscale. The dune area between the junipers and the shadscale appears to be the preferred habitat of *sharonae*. Nearly all of the specimens were collected as they fed at the flowers of *Eriogonum dubium* Stark, which holds a prominent place in the vegetation of the dunes.

During the latter part of August and early September these large flies were quite common in this area. They were mistaken for *Exoprosopa titubans* O.S., and since space is an important factor in our collection only a few specimens were collected. By the time it was discovered that the species was apparently undescribed it had become quite rare, and it was with difficulty that one badly worn male was obtained for dissection.

The figures of the wing and antenna are taken from the holotype. The types are in our collection. Part of the paratypes are in the collection of the University of Utah.

This species is named for our twelve year old daughter, who, without benefit of a net, collected the allotype female in near perfect condition.

*Exoprosopa utahensis*, n. sp.

Figs. 4, 9, 20, 21

Slender, black species. wings smoky. antennal style short. Length 14-17 mm.

PLATE I

Fig. 1, *Exoprosopa butleri*, n. sp., wing of holotype. Fig. 2, *Exoprosopa sharonae*, n. sp. wing of holotype. Fig. 3, *Exoprosopa doris* O.S., Utah specimen. Fig. 4, *Exoprosopa utahensis*, n. sp., wing of holotype. Fig. 5, *Exoprosopa arenicola*, n. sp., wing of holotype. Fig. 6, *Exoprosopa sharonae*, n. sp., abdomen of holotype. Fig. 7, *Exoprosopa cingulata*, n. sp., wing of holotype. Fig. 8, *Exoprosopa cingulata*, n. sp., abdomen of holotype. Fig. 9, *Exoprosopa utahensis*, n. sp., abdomen of holotype. Fig. 10, *Exoprosopa doris* O.S., Utah specimen, male. Fig. 11, *Exoprosopa arenicola*, n. sp., abdomen of holotype. Fig. 12, *Exoprosopa butleri*, n. sp., abdomen of holotype.

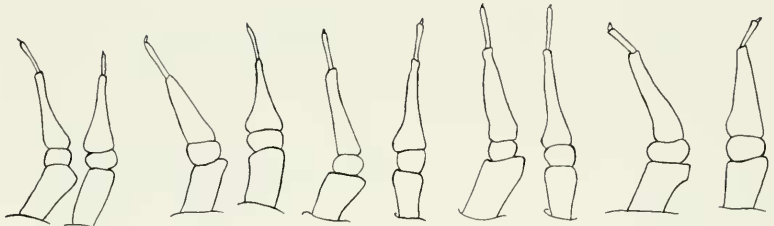


Fig. 13

Fig. 14

Fig. 15

Fig. 16

Fig. 17

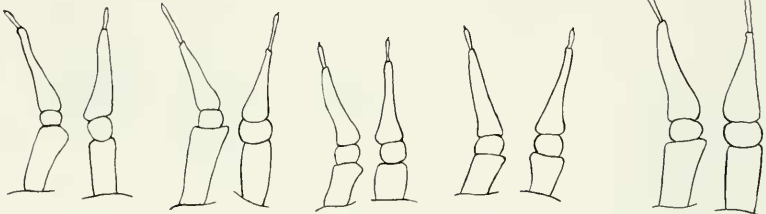


Fig. 18

Fig. 19

Fig. 20

Fig. 21

Fig. 22

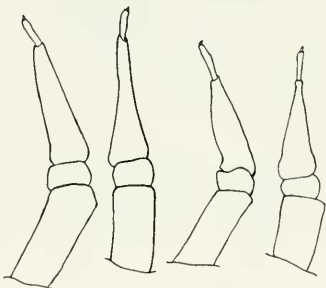


Fig. 23

Fig. 24



Fig. 25



Fig. 26



Fig. 27



Fig. 28

*Male*.—Head black, cheeks and oral margins yellow. Front and face brownish pollinose, occiput cinereous pollinose. Pile of front and center of face short, sparse and black, that of front suberect. Pile of sides of face and occiput nearly white, a patch of black hairs on the anterior oral margin. Tomentum of front and face pale golden brown, of post orbits shining, nearly white. Antennae black, the second segment reddish beneath; pile black. First segment twice as long as wide, second about four-fifths as wide as first, third only about one and one-third times as long as first two combined; style about as long as width of base of segment at its widest part. Proboscis projects about the length of the labellae beyond the epistoma.

Thorax black, fore part of the mesonotum and pleura cinereous pollinose. Pile of pleura very pale yellow, upper part on anterior half with a reddish tinge, whitish above the wings. Tomentum of mesonotum black, with three vittae of yellowish scales, joining on the posterior part; bristles black, pile just before the scutellum mixed black and yellow. Scutellum red, black basally, pile and bristles black, tomentum mixed black and yellow, mostly yellow on the sides and hind margin, mostly black medially and anteriorly.

Wings dusky, dark before the fourth vein. All veins bordered with brown except distally. Veins brown at base, nearly black distally. Pile and tomentum at base of costa black. Halteres brown.

Legs evidently dark reddish brown in ground color, densely covered with mostly black scales. Coxae with subshining yellow tomentum; pile of fore coxae pale yellow except a few black ones at the tip, that of middle coxae black, and of hind coxae pale yellow.

Abdomen black, red laterally on segments two to five, sixth and seventh segments yellow. Pile on sides of first segment abundant, pale yellow; that on following segments unusually short and quite sparse, on second, third and fourth tergites mostly pale with a few black hairs on hind angles, on fifth, sixth and seventh mostly black. Pile on hind margins of last three tergites unusually short, black on fifth and sixth, mixed black and red on seventh. A fringe of black tomentum along hind margins of all tergites except seventh. Tomentum of second tergite white on basal half, black otherwise, the white narrowly tinged with yellow next the black. Tomentum of third ter-

#### PLATE II

Each antenna is figured twice, that on the left representing the dorsal, and that on the right the lateral aspect of the same antenna.

Fig. 13, *Exoprosopa butleri*, n. sp., allotype. Fig. 14, *Exoprosopa butleri*, n. sp., holotype. Fig. 15, *Exoprosopa sharonae*, n. sp., allotype. Fig. 16, *Exoprosopa sharonae*, n. sp., holotype. Fig. 17, *Exoprosopa cingulata*, n. sp., allotype. Fig. 18, *Exoprosopa doris* O.S., Utah specimen, female. Fig. 19, *Exoprosopa doris*, O.S., Utah specimen, male. Fig. 20, *Exoprosopa utahensis*, n. sp., allotype. Fig. 21, *Exoprosopa utahensis*, n. sp., holotype. Fig. 22, *Exoprosopa cingulata*, n. sp., holotype. Fig. 23, *Exoprosopa arenicola*, n. sp., allotype. Fig. 24, *Exoprosopa arenicola*, n. sp., holotype. Fig. 25, *Exoprosopa doris*, O. S., Utah specimen, male genitalia. Fig. 26, *Exoprosopa sharonae*, n. sp., paratype, male genitalia. Fig. 27, *Exoprosopa arenicola*, n. sp., paratype, male genitalia. Fig. 28, *Exoprosopa butleri*, n. sp., paratype, male genitalia.

gite narrowly yellow basally, white at sides, black along caudal third, rest of tomentum mixed black and yellow, mostly black. Tomentum of fourth tergite white, tinged with yellow centrally and caudally; that of fifth mixed pale yellow and black, mostly black, centrally; mostly yellow on sides; that of sixth and seventh white, that on sixth tinged with yellowish apically. Ground color of venter mostly obscured by dense silvery white tomentum, evidently red except basally on first four segments. A fascia of black scales basally on fifth sternite, a few black scales on sides of sixth. Pile nearly white. Genitalia red.

*Female*.—Like the male in most respects. Only second and third tergites red on the sides. Tomentum of abdomen nearly all either black or white, very few of the scales showing the yellowish cast found in the male. Hairs of hind margin of seventh segment all black. The black tomentum of the mesonotum is reduced in extent to a fascia on each side and two spots on the anterior third of the disc. There are some pale scales on the base of the costa. The venter is largely black, only the hind margins of some of the segments being red. Spines of genitalia red. There are some yellow hairs on the under side of the first antennal segment.

*Types*.—Male *holotype*, Antelope Springs, House Range, Milard Co., Utah, August 10, 1943 (D. E. Johnson). Female *allotype*, southeast end Cedar Mts., Tooele Co., Utah, August 28, 1955 (D. E. Johnson). *Paratypes*: 3♂ same data as the holotype; 1♂ Cane Springs, Cedar Mts., Tooele Co., Utah, VIII-10, 1955 (D. E. Johnson); 1♀ Deep Creek Mts., near Callao, Juab Co., Utah, VIII-4, 1953 (H. E. Cott). The latter specimen is in the collection of the University of Utah.

The specimens at hand are remarkably uniform in size and coloration. Because of the very short pile on the lateral abdominal margins the specimens of this species have a very trim appearance.

The three localities where this species was encountered are all about the same type of ecological situations. In each case the specimens were collected on dry, rocky hillsides, among scattered Utah Junipers. All localities are above five thousand feet elevation. The type was collected about a mile north of the old Civilian Conservation Corps camp at Antelope Springs.